UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 4
ATLANTA FEDERAL CENTER
61 FORSYTH STREET
ATLANTA, GEORGIA 30303-8960

JUL 29 2013

Mr. Herschel T. Vinyard
Secretary
Florida Department of Environmental Protection
3900 Commonwealth Boulevard
Tallahassee, Florida 32399-3000

Dear Secretary Vinyard:

The U. S. Environmental Protection Agency has completed its review of the site specific alternative criteria (SSAC) for total nitrogen (TN) and total phosphorus (TP) for the Indian River Lagoon and Banana River Lagoon (IRL). Florida Department of Environmental Protection submitted revised Chapter 62-302, including the SSAC, to the EPA on June 13, 2012, as new or revised water quality standards with the necessary certification by FDEP general counsel, pursuant to 40 CFR 131. The SSAC were included in the list of site specific numeric interpretations of paragraph 62-302.530(47)(b), Florida Administrative Code (F.A.C.), referenced in paragraph 62-302.531(2)(a), F.A.C. and published at FDEP's website at http://www.dep.state.fl.us/water/wqssp/swq-docs.htm. FDEP submitted the numeric interpretations of the state narrative nutrient criterion for WBIDs 3044A, 3057A, 3057B, 3057C, 2963A, 2963B, 2963C, 2963D, 2963E, 2963F, 5003B, 5003C and 5003D in the IRL Total Maximum Daily Load report as the SSAC. FDEP intends for these SSAC to serve as the numeric nutrient criteria for TN and TP for IRL.

In accordance with section 303(c) of the Clean Water Act, I am hereby approving the SSAC for the IRL as revised water quality standards for TN and TP. Any other criteria applicable to this waterbody remain in effect. The details of the SSAC are discussed in the enclosed documentation. We would like to commend you and your staff for your continued efforts in environmental protection for the State of Florida.

If you have any questions regarding the EPA's approval, please contact me at (404) 562-9345 or have a member of your staff contact Ms. Annie M. Godfrey, Water Quality Standards Section Chief at (404) 562-9967.

Sincerely,

Gail Mitchell for

James D. Giattina
Director
Water Protection Division

Enclosure

cc: Mr. Thomas M. Beason, FDEP
Mr. Daryll Joyner, FDEP

Decision Document for Hierarchy 1 Site Specific Alternative Criteria for Indian River Lagoon and Banana River Lagoon (IRL)

Summary Information

WBID	Description	Class	Waterbody Type *Impaired Waters Rule (IWR) Run 40*	Listing Parameter
Banana River Lagoon (BRL)				
3044A	Newfound Harbor	Class III (marine)	Estuary	Nutrients (Seagrass)
3057A	Banana River below Mathers			
3057B	Banana River above 520 Causeway			
3057C	Banana River above Barge Canal			
Central Indian River Lagoon (Central IRL)				
2963A	Indian River above Sebastian Inlet	Class II	Estuary	Nutrients (Seagrass)
5003D	South Indian River	Class II	Estuary	Nutrients (Seagrass)
5003B	South Indian River	Class II	Estuary	Nutrients (Seagrass)
5003C	South Indian River	Class III (marine)	Estuary	Nutrients (Seagrass)
North Indian River Lagoon (North IRL)				
2963B	Indian River above Melbourne Causeway	Class III (marine)	Estuary	Nutrients (Seagrass), Nutrients (chlorophyll-*a* (chl *a*))
2963C	Indian River above Melbourne Causeway	Class II	Estuary	Nutrients (Seagrass)
2963D	Indian River above 520 Causeway	Class III (marine)	Estuary	Nutrients (Seagrass) and Dissolved Oxygen (DO)
2963E	Indian River above NASA Causeway	Class III (marine)	Estuary	Nutrients (Seagrass)
2963F	Indian River above M. Brewer Causeway	Class II	Estuary	Nutrients (Seagrass), Nutrients (chl *a*), and DO

A nutrient and Dissolved Oxygen (DO) Total Maximum Daily Load (TMDL) for the IRL for WBIDs 3044A, 3057A, 3057B, 3057C, 2963A, 2963B, 2963C, 2963D, 2963E, 2963F, 5003B, 5003C and 5003D was developed by Florida Department of Environmental Protection and approved by the U.S. Environmental Protection Agency on November 16, 2009, pursuant to section 303(d) of the Clean Water Act (CWA). This TMDL was developed to identify the level of nutrients that would prevent an imbalance of flora and fauna as required by the state's narrative nutrient criterion at paragraph 62-302.530(47)(b), Florida Administrative Code (F.A.C). FDEP determined that total nitrogen (TN) and total phosphorus (TP) loads as pounds

per year (lbs/yr) listed in the table below, not to be exceeded as annual loads, would meet their narrative criterion and adopted these loads as TMDL values at subsection 62-304.520(3)-(11), F.A.C.:

WBID	TN (lbs/yr)	TP (lbs/yr)
2963F	177,220	9,320
2963E	173,232	14,793
2963D	147,524	11,845
2963B+2963C	189,068	20,592
5003D+2963A	684,715	111,594
5003B+5003C	278,273	53,599
3057C	116,314	7,825
3057A+3057B	144,780	12,181
3044A	30,661	3,247

FDEP has submitted the TN and TP loads from the TMDL for the EPA review as hierarchy 1 site specific alternative nutrient criteria (SSAC) for the aforementioned IRL WBIDs 3044A, 3057A, 3057B, 3057C, 2963A, 2963B, 2963C, 2963D, 2963E, 2963F, 5003B, 5003C and 5003D, pursuant to section 303(c) of the CWA and the EPA's implementing regulations at 40 C.F.R. Part 131. This decision document approves the SSAC for the loads specified above, not to be exceeded as annual loads, as hierarchy 1 criteria. Any other criteria applicable to this waterbody remain in effect, including the requirements of paragraph 62-302.530(47)(a), F.A.C.

In the letter dated June 13, 2012, from Thomas M. Beason, General Counsel for FDEP, to Gwendolyn Keyes Fleming, Regional Administrator of the EPA's Region 4 Office, FDEP submitted the numeric interpretation of the state narrative nutrient criterion as expressed in the IRL TMDL as the SSAC for WBIDs 3044A, 3057A, 3057B, 3057C, 2963A, 2963B, 2963C, 2963D, 2963E, 2963F, 5003B, 5003C and 5003D. These SSAC serve as primary site specific interpretations of Florida's narrative water quality criterion for nutrients set out in paragraph 62-302.530(47)(b), F.A.C., in accordance with paragraph 62-302.531(2)(a), F.A.C. Pursuant to section 303(c) of the CWA, these revised water quality standards are subject to review and approval by the EPA since FDEP intends for these SSAC to serve as a numeric nutrient criteria for TN and TP for IRL. In the June 13, 2012, letter FDEP General Counsel certified that the revised water quality standards were duly adopted pursuant to Florida law.

The EPA's decision to approve these criteria is subject to the results of consultation under section 7 of the Endangered Species Act with the U.S. Fish and Wildlife Service. By approving the standards "subject to the results of consultation," the EPA retains its discretion to take appropriate action if the consultation identifies deficiencies in the standards requiring remedial action by the EPA. The EPA will notify FDEP of the results of the section 7 consultation upon completion of the action.

Description of Waters for which the SSAC have been proposed

According to the 2009 TMDL, the thirteen waterbodies included in this TMDL are all within the portion of the 156-mile-long IRL basin that runs south of Ponce de Leon Inlet to just north of Fort Pierce Inlet (see map on page 6). This portion of the greater IRL basin includes the southeastern corner of Volusia County and eastern portions of Brevard and Indian River counties, primarily located between Interstate Highway 95 and the central portion of Florida's Atlantic coast. The acronym "IRL" in this document signifies the 13 segments from three sublagoons: Banana River Lagoon (BRL), Central Indian River Lagoon (Central IRL) and North Indian River Lagoon (North IRL). The North IRL and the BRL are poorly flushed and have minimal stream inflow, while the Central IRL is also poorly flushed but has comparatively larger stream flows. The entire IRL system was designated as a priority waterbody in the 1987 Surface Water Improvement and Management Act, noted as needing restoration and protection. Developed land (urban and built-up) composes about 31 percent of the non-water area in the 467,167-acre basin.

The BRL is one of three sub-lagoons within this TMDL and includes WBID 3044A, WBID 3057A, WBID 3057B and WBID 3057C. The watershed draining to the BRL is about 51,423 acres; 35 percent of the acreage is in urban land uses (i.e., residential, transportation, communication, utilities). The BRL has the longest residence time of the three sub-lagoons, with small stream inflows and one intermittent navigational ocean connection through Port Canaveral. WBIDs 3044A, 3057A, 3057B and 3057C are Class III (marine) waterbodies with designated uses of recreation, propagation, and maintenance of a healthy, well-balanced population of fish and wildlife. Central IRL includes four WBIDs: WBID 2963A, WBID 5003B, WBID 5003C and WBID 5003D. All points in Central IRL are within 28 kilometers (km) of an inlet (Sebastian Inlet or Ft. Pierce Inlet); consequently, this sub-lagoon has the highest flushing of the three sub-lagoons by a magnitude of 10 to 15 in comparison to North IRL and BRL. The watershed draining into the Central IRL encompasses 283,609 acres; 34 percent of the acreage is in urban land uses (i.e., residential, transportation, communication, utilities) and another 27 percent is in agricultural land uses. With 61 percent watershed coverage in anthropogenic land uses, Central IRL has the highest human land dominance of the three sub-lagoons covered in this TMDL. WBIDs 2963A, 5003B and 5003D are Class II waterbodies with designated uses of shellfish propagation or harvesting and WBID 5003C is a Class III (marine) waterbody with a designated use of recreation, propagation, and maintenance of a healthy, well-balanced population of fish and wildlife. North IRL includes WBID 2963B, WBID 2963C, WBID 2963D, WBID 2963E and WBID 2963F. The watershed draining to North IRL encompasses 132,135 acres; 25 percent of the acreage is in urban land uses (i.e., residential, transportation, communication, utilities) and 9 percent of the acreage is in agricultural lands. WBIDs 2963C and 2963F are Class II waterbodies with designated uses of shellfish propagation or harvesting. WBIDs 2963B, 2963D and 2963E are Class III (marine) waterbodies with designated uses of recreation, propagation, and maintenance of a healthy, well-balanced population of fish and wildlife.

Discussion of how the loads were derived

According to the 2009 TMDL, the BRL WBIDs 3044A, 3057A, 3057B and 3057C, the Central IRL WBIDs 2963A, 5003B, 5003D, 5003C and five North IRL WBIDs WBIDs 2963B, 2963C,

2963D, 2963E and 2963F were verified as impaired for nutrients due to suppressed seagrass coverage. Consequently, these WBIDs were added to the verified list of impaired waters by Secretarial Order on December 12, 2007. With the exceptions of those noted below, the WBIDs in this TMDL were not impaired for nutrients by IWR standards and the annual average chl *a* level did not exceed the IWR threshold of 11 µg/L during the 1999 – 2006 verified period. In addition, the chl *a* levels did not exceed the 5-year historical minimum annual average by over 50 percent in two consecutive years. However, as permitted by the IWR, FDEP verified nutrient impairment on the basis of depressed seagrass coverage, which literature has linked to nutrient pollution. In addition, WBIDs 2963B and 2963F were exceeding the IWR chl *a* threshold of 11 µg/L. Chl *a* levels in WBID 2963B ranged from 1.2 to 61.5 µg/L between 1999 and 2006, with chl *a* exceedances in 2001, 2002 and 2005. Chl *a* levels in WBID 2963F ranged from 1.0 to 285.0 µg/L during the same period, with exceedances in 1999 - 2002 and 2004 - 2005. WBIDs 2963D and 2963F were verified as impaired for DO with nitrogen identified as a possible causative pollutant (16.7% and 24.9% of samples were below the DO criterion). To address the aforementioned impairments in the Indian River Lagoon and the BRL, FDEP developed a nutrient and DO TMDL dated December 12, 2007 that was approved by the EPA on November 16, 2009. The TMDL was adopted at 62-304.520(3)-(11) for the aforementioned loads.

FDEP developed TN and TP loads with the goal of seagrass restoration using historical seagrass coverages and estimates of point and non-point source nutrient loads. For nutrient derivation in this TMDL, seagrass depth-limit targets were set at a depth compensation point of no more than 10 percent from natural background conditions (i.e. 10 percent shallower than full-restoration depth targets in compliance with F.A.C. 62-302.530(67)). Seagrass targets and, in turn, nutrient loads were based on segment-specific, full-restoration seagrass depth limits and the relationship between seagrass depth limits and TN and TP loadings. The full-restoration depths were set to the deep-edge boundary of the unified seagrass coverages based on long term historical data. The full-restoration depths were set to the deep-edge boundary of the unified seagrass coverages from 1943, 1986, 1989, 1992, 1994, 1996 and 1999. Seagrass depth targets in Central IRL were empirically related to TN and TP loadings where concurrent nutrient loading and seagrass data were available (1996, 1999 and 2001). In Central IRL, the median seagrass depth target was 1.2 - 1.7 meters. These targets were substituted into the established regression equation to obtain Central IRL seagrass-based nutrient loads of 2.90 lbs/acre/yr TN and 0.574 lbs/acre/yr TP. Lagoon-wide loads were also calculated and were 3.34 lbs/acre/yr TN and 0.546 lbs/acre/yr TP.

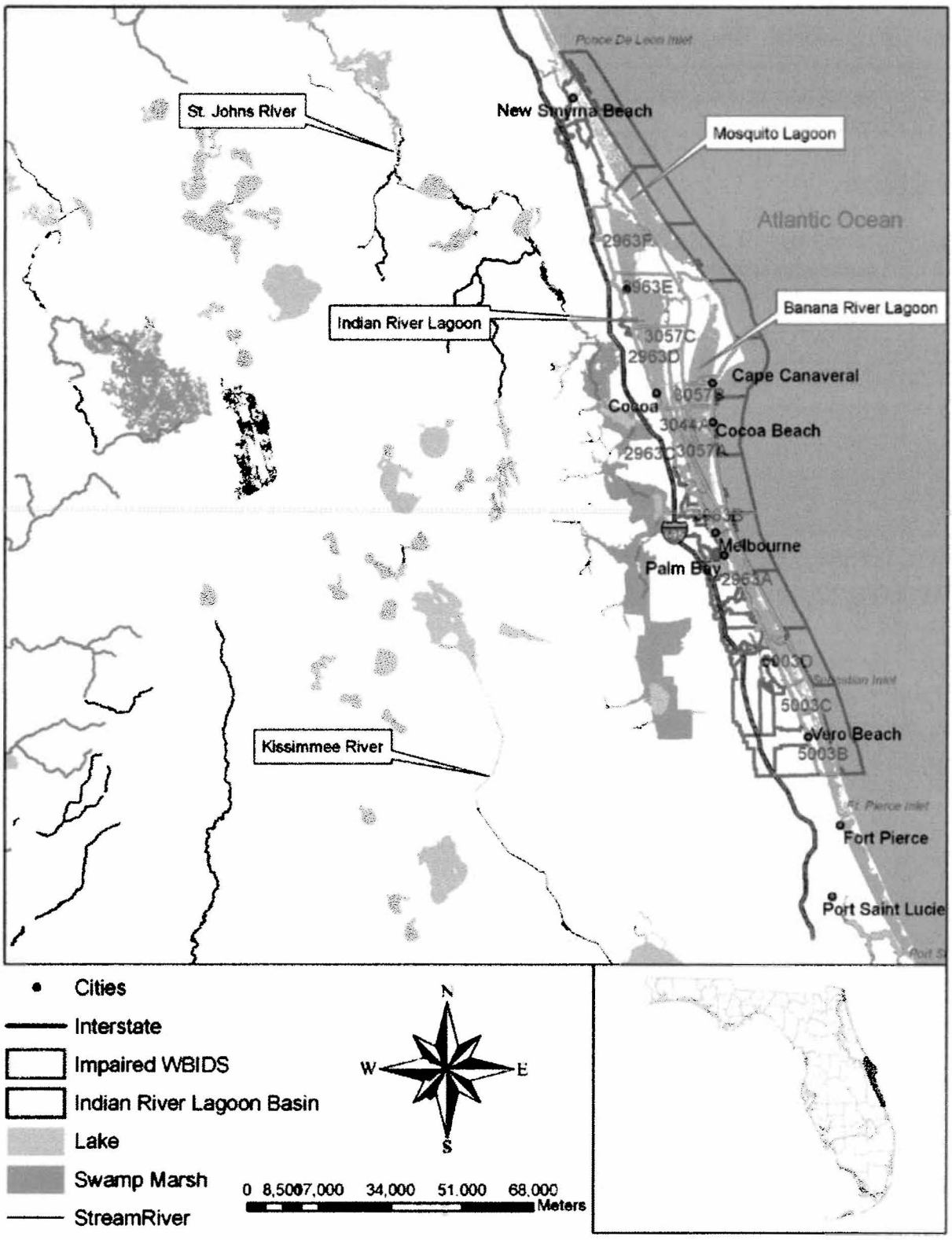
Consideration of TMDL load as a new or revised water quality standard

Seagrass depth targets were developed to control nutrients and restore seagrass based on models linking phosphorus and nitrogen loads to seagrass depth targets (Steward et al. 2005). The seagrass depth targets allow for no more than 10 percent departure from natural background conditions. It is expected that, when the seagrass restoration target is achieved, the impact of excessive nutrients on DO criterion in the lagoon will be met restoring healthy seagrass communities and providing healthy habitat for fish and other aquatic organisms. Florida developed site specific estuary criteria utilizing various means to protect recreation and a healthy, well-balanced population of fish and wildlife. For this estuary FDEP chose a prescriptive endpoint of healthy seagrass beds. In order to improve and restore seagrass in this

estuary, FDEP used a conceptual model to relate seagrass health through a series of steps back to input of TN and TP. The steps in the pathway consist of: (1) seagrass growth and reproduction, as controlled by (2) seagrass light requirements, which are in turn affected by (3) light attenuation in the water column that results in part from (4) chl *a* which is influenced by (5) TN and TP loads.

Conclusion

Based on the chemical, physical and biological data presented in the development of the SSAC, the EPA concludes that the SSAC for TN and TP established for the IRL for WBIDs 3044A, 3057A, 3057B, 3057C, 2963A, 2963B, 2963C, 2963D, 2963E, 2963F, 5003B, 5003C and 5003D protect healthy, well-balanced biological communities in the waters to which the SSAC apply and are consistent with the CWA and its implementing regulations. More specifically, the SSAC are consistent with both 40 CFR 131.11(b)(1)(ii), and the EPA's 304(a) guidance on nutrient criteria. The TN and TP SSAC for IRL for WBIDs 3044A, 3057A, 3057B, 3057C, 2963A, 2963B, 2963C, 2963D, 2963E, 2963F, 5003B, 5003C and 5003D will protect water quality and aquatic life. Paragraph 62-302.531(4) will apply to these WBIDs in conjunction with the Hierarchy 1 SSAC to ensure attainment and maintenance of water quality standards of downstream waters, in accordance with 40 CFR 131.10. In accordance with section 303(c) of the CWA, the SSAC for IRL for the loads specified on page 2, not to be exceeded as annual loads, is hereby approved as consistent with the CWA and 40 CFR Part 131.



Location of the Indian River Lagoon Basin and relevant WBIDs (TMDL p. 2, Figure 1.1)

Appendix 1 – Summary of the TMDL Background

Name(s) of Addressed Water(s)	**Banana River Lagoon (BRL)** Newfound Harbor, Banana River below Mathers, Banana River above 520 Causeway, Banana River above Barge Canal **Central Indian River Lagoon (Central IRL)** (Indian River above Sebastian Inlet and South Indian River Lagoon) **North Indian River Lagoon (North IRL)** (Indian River above Melbourne Causeway, Indian River above Melbourne Causeway, Indian River above 520 Causeway, Indian River above NASA Causeway, and Indian River above M. Brewer Causeway)
Waterbody Type(s)	Estuary (IWR Run 40)
WBIDs	WBIDs 3044A, 3057A, 3057B, 3057C, 2963A, 2963B, 2963C, 2963D, 2963E, 2963F, 5003B, 5003C and 5003D
Latitude/Longitude	NA.
Description	The thirteen waterbodies included in this TMDL are all within the portion of the 156-mile-long Indian River Lagoon (IRL) basin that runs south of Ponce de Leon Inlet to just north of Fort Pierce Inlet. The three sublagoons within this portion of the IRL are Banana River Lagoon (BRL), Central Indian River Lagoon (Central IRL) and North Indian River Lagoon (North IRL). This portion of the IRL basin includes the southeastern corner of Volusia County and eastern portions of Brevard and Indian River counties, primarily located between Interstate Highway 95 and the central portion of Florida's Atlantic coast. The BRL includes four WBIDs: WBID 3044A, WBID 3057A, WBID 3057B and WBID 3057C. The watershed draining to the BRL is about 51,423 acres; 35 percent of the acreage is in urban land uses. The BRL has the longest residence time of the three sublagoons, with small stream inflows and one intermittent navigational ocean connection through Port Canaveral (TMDL p. 1). Central IRL includes four WBIDs: WBID 2963A, WBID 5003B, WBID 5003C and WBID 5003D. The watershed draining into the central IRL encompasses 283,609 acres; 34 percent of the acreage is in urban land uses (i.e., residential, transportation, communication, utilities) and another 27 percent is in agricultural land uses. North IRL includes five WBIDs: WBID 2963B, WBID 2963C, WBID 2963D, WBID 2963E and WBID 2963F. The watershed draining to North IRL encompasses 132,135 acres; 25 percent of the acreage is in urban land uses (i.e., residential, transportation, communication, utilities) and 9 percent of the acreage is in agricultural lands (TMDL p. 34).
Classification(s)	WBIDs 2963A, 5003D, 2963C, 2963F, 5003B are Class II. WBIDs 3044A, 3057A, 3057B, 3057C, 5003C, 2963B, 2963D, 2963E are Class III (marine). (TMDL p. 10).
Basin	Indian River Lagoon Basin (TMDL p. 1)
Date Placed on Verified List	December 12, 2007 (TMDL p. 1)
Date TMDL was	November 16, 2009 (EPA WATERS database query June4,2012)

approved by EPA	
Reference Streams/Lakes	NA.
Source of Majority of Flow	Circulation in the IRL system is controlled by wind, freshwater inflow from streams, and tidal exchange through inlets. Freshwater inflows include streams, direct overland runoff, drainage canals, groundwater seepage, and direct rainfall. The BRL has relatively minimal freshwater stream inflow, and poor flushing, with one intermittent navigational connection through Port Canaveral (TMDL p. 1). The central IRL sub-lagoon has the highest flushing of the three sun-lagoons; the central IRL flushing rate is 10 times higher than the North IRL and 15 times higher than the BRL. (TMDL p. 11).
Indicators	Excessive nutrient loads were identified with SJRWMD's observation of decreased seagrass distribution in the IRL and the comparison of existing seagrass depth limits with seagrass full-restoration targets (TMDL p. 1, 11). The TMDL states that the majority (75%) of the IRL system has experienced loss or alteration of saltmarsh and mangrove wetland communities. Nutrient pollution from wastewater and storm water discharges caused turbidity levels to intensify and promoted algal growth, which contributed to seagrass damage in the IRL according to the TMDL (TMDL p. 1-2, 5). Nutrient loads were selected on the basis of calculated seagrass depth targets and the correlation of the selected depth targets with TN and TP loadings (TMDL p. 11-15).
Identification of Causative Pollutants (as determined by measurements of response endpoints or indicators)	WBIDs in the Central IRL and BRL were verified as impaired due to excessive amounts of phosphorus and nitrogen, based on evidence of depressed seagrass (TMDL p. 1). WBIDs in the North IRL were verified as impaired based on evidence of depressed seagrass, elevated chl *a*, and low DO, as verified through assessments (TMDL p. 1, 7). Nutrient impairment in main stem segments of the IRL/BRL system were based on information provided by the SJRWMD that seagrass coverage in these segments were depressed when compared with the seagrass target depth limit (Steward and Green 2005, Gallegos 1994, Steward et al. 2003, Hanisak 2001, Trefry and Feng 1991, and Philps et al. 2002) (TMDL p. 5-7). Previous studies indicate that both TP and TN are important factors influencing seagrass distribution in these three systems which led to these five WBIDs being listed as impaired for nutrients (Trefry and Feng 1991, Gallegos 1994, Hanisak 2001, Phlips et al. 2002, Steward et al. 2003) (TMDL p. 11). Water quality data collected verified impairment of DO in WBID 2893D and 2963F. 770 out of 4,603 samples in WBID 2963D and 237 out of 952 samples in WBID 2963F had DO lower than 5.0 mg/L. TN was also measured at elevated levels in the WBIDs suggesting this was the cause of impairment (TMDL p. 7). Measured data was also used to identify chl *a* impairment in WBID 2963B and 2963F. For these WBIDs annual average chl *a* concentrations in 2001, 2002, 2005 and 1999 through 2002, 2004 and 2005, respectively, exceeded 11 µg/L. Median TN/TP ratios suggested the cause of chl *a* impairment was phosphorus and nitrogen (TMLD p. 7).

Sources and Concentrations of Nutrient Enrichment	The majority of TN and TP loadings in the IRL watersheds are from nonpoint sources with point sources usually accounting for less than 5 percent of the total watershed load (TMDL p. 52). Negative correlations between nutrient concentrations and salinity suggest the watershed as a major source of nutrients (TMDL p. 7) (Hanisak 2001). In addition to watershed runoff, the TMDL identifies ground water input and direct atmospheric deposition as other sources of nonpoint source nutrient loading (TMDL p. 52, 28). Forty-one NPDES-permitted facilities were identified in the IRL Basin; 19 of these were concrete batch plants not considered significant sources of nutrients and no nutrient monitoring was required in these permits (TMDL p. 19). NPDES-permitted facilities discharged about 48,695 lbs/yr of TN and 4,716 lbs/yr of TP into the IRL/BRL lagoon system (TMDL p. 25). Two domestic and one industrial NPDES-permitted point sources discharge directly to the WBIDs in the BRL (TMDL p. 23).
Nutrient Watershed Region in Proposed 62.302	NA. WBIDs in IRL are estuarine waterbodies (IWR Run 40).
Proposed Nitrogen SSAC and Frequency	WBID — TN (lbs/yr) 2963F — 177,220 2963E — 173,232 2963D — 147,524 2963B+2963C — 189,068 5003D+2963A — 684,715 5003B+5003C — 278,273 3057C — 116,314 3057A+3057B — 144,780 3044A — 30,661 (TMDL Page 47, Table 5.2)
Proposed Phosphorus SSAC and Frequency	WBID — TP (lbs/yr) 2963F — 9,320 2963E — 14,793 2963D — 11,845 2963B+2963C — 20,592 5003D+2963A — 111,594 5003B+5003C — 53,599 3057C — 7,825 3057A+3057B — 12,181 3044A — 3,247 (TMDL Page 47, Table 5.2)
Biological Index Score(s) (e.g. SCI, TSI, IBI)	NA.